DEFENSE

THE DEFENSE BUDGET

The DoD Slice of The Pie

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ISSUE 2

An M-1 Abrams tank is
brought into Naval Station
Rota, Spain, aboard an
air- cushioned landing craft,
for washdown and inspection
to remove agricultural debris
prior to return to the
United States.

DISCLAIMER NOTICE

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COVERS: Modernization has a high priority in the DoD budget pie, including six new leap-ahead systems like the Navy's strike-fighter F/A-18F Super Hornet, **top, back cover,** and cost effective upgrades on existing weapons systems such as the Army's M-1 Abrams tank, **center, back cover,** and the CH-47 helicopter, **bottom, back cover.** Front cover photograph by Mark Borchelt.

DTIC QUALITY INSPECTED

PH2 Keith W. Downey, USN

By William S. Cohen, *Secretary of Defense*

hile the threat of nuclear holocaust has been significantly reduced, the world remains a very unsettled and dangerous place. Hostile regimes and instability threaten U.S. interests in key regions. The proliferation of weapons of mass destruction and the ballistic missiles that deliver them continue to be a serious concern. The threats of terrorism, international organized crime and drug trafficking remain unabated. Because the global economy is increasingly interdependent, our future well-being can be threatened by conflicts within or between nations and by other disruptions to trade and stability.

America must remain actively engaged in this complex global environment. We must exert strong leadership to deter aggression, foster peaceful resolution of conflicts, underpin stable foreign markets, encourage democracy and promote a better future for the community of nations. An absolutely central component of strong U.S. leadership will continue to be our military strength. We cannot be the world's policeman, but we must recognize that strong U.S. leadership on behalf of stability and democracy is in our own best interest.

Serious threats to U.S. security and well-being can be found in all key regions of the globe and generally can best be addressed in concert with others. Therefore, America must continue to cultivate the cooperation of other nations, directly and through international organizations. We must keep our security alliances strong and adapt them to this post-Cold War world. America also must be prepared to act unilaterally when necessary — to intervene decisively if U.S. vital interests are at stake.

n particular, America must continue to forge a pragmatic partnership with Russia through efforts to nurture close NATO-Russia relations, strengthen U.S.-Russian military-to-military cooperation, continue Cooperative Threat Reduction activities and advance our arms control agenda. Our policies also need to recognize the ever-increasing importance of the East Asia-Pacific region.

Our national security is not only a matter of defense, but also of diplomacy. Indeed, the two are closely linked. Our foreign affairs programs can strengthen America's security in close synergy with our military strength. For example, the forging of our overall relationship with Russia encompasses activities ranging from DoD's Cooperative Threat Reduction program to the State Department's Freedom Support Act programs. Mindful of that reality, I have urged Congress to provide healthy funding for

DoD's international affairs programs. A strong military is a necessary support to a successful diplomacy; successful diplomacy can often make the costly use of that military unnecessary.

Arms control also can be a high-payoff, low-cost means to advance U.S. security. For example, the Chemical Weapons Convention provides a major advancement for America's disarmament and nonproliferation goals. I urge the Senate to advise and consent to ratification of the convention, which would commit other nations to the measures the United States already is pursuing.

Over the past few years, President Clinton and former Defense Secretary Bill Perry made substantial progress meeting the complex challenges of this new security era, and I will do my utmost to build upon their accomplishments.

President Clinton's fiscal 1998 defense budget begins implementation of the fiscal 1998-2003 Future Years Defense Program. The fiscal 1998 request totals $250.7 billion in budget authority and $247.5 billion in outlays for DoD. Budget authority for fiscal 1998 is $2.6 billion above the amount in last year's DoD plan.

For fiscal 1999 through 2003, plans call for DoD budget authority to increase above projected inflation. This planned real growth was possible because President Clinton

added $7 billion to the previously planned DoD topline and allowed DoD to keep $4 billion of inflation savings. This is the fifth time in four years President Clinton increased defense spending above previously planned levels.

DoD budget authority requested for fiscal 1998 is, in real terms, about 40 percent below its level in fiscal 1985, the peak year for inflation-adjusted defense budget authority since the Korean War. As a share of America's gross domestic product, DoD outlays will fall to 3 percent in fiscal 1998, well below average levels over the past five decades.

While I was not involved in preparing this budget request, I recommend Congress fully support it. It will sustain America's military might and our active engagement around the world. Having said this, however, I will review major DoD plans and programs over the next few months in connection with the Quadrennial Defense Review. The central

BUDGET AUTHORITY
($ Billions)

	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
Military Personnel	69.8	69.9	69.5	70.1	71.4	73.3	75.3
O&M	93.7	92.9	93.7	91.5	92.2	93.9	92.0
Procurement	42.4	44.1	42.6	50.7	57.0	60.7	68.3
RDT&E	35.0	36.6	35.9	35.0	33.4	32.9	34.2
Military Construction	6.9	5.9	4.7	4.2	4.3	4.2	3.4
Family Housing	4.3	4.1	3.7	3.9	3.9	4.0	3.9
Revolving Funds	3.1	2.3	1.7	1.7	1.3	1.4	1.4
Rescission	—	- 4.8	—	—	—	—	—
Other	- .6	- 1.0	- 1.0	- .9	- .8	- .8	- 1.0
TOTAL	254.4	250.0	250.7	256.3	262.3	269.3	277.5
Army	64.5	62.4	60.1	62.2	63.8	65.5	67.5
Navy/Marine Corps	80.0	78.9	79.1	80.7	82.2	83.9	87.6
Air Force	73.0	72.4	75.0	76.7	78.5	81.7	83.6
Defensewide	37.0	36.4	36.4	36.7	38.2	38.6	38.8
TOTAL	254.4	250.0	250.7	256.3	262.8	269.8	277.5

BY TITLE

BY COMPONENT

Investments in people offer the greatest returns for America's defense dollars.

goal of the review is to ensure a proper match of strategy, programs and resources. I expect important results, but it is too early to predict those results.

In considering the department's budgetary needs, I will stress three top priorities.

My first priority goes to people. We must continue to attract and retain the high quality personnel necessary to preserve U.S. military superiority. The increasing complexity of technology, quickening pace of warfare and growing unpredictability of the international scene require our people be more adaptable and versatile than ever. The key to America's military strength is the superb quality of our uniformed men and women.

My second priority is readiness. We must ensure the force readiness needed to carry out U.S. defense strategy, so our forces are able to respond to crises whenever and wherever necessary. To support both my priorities of people and readiness, we must provide a good quality of life for our military personnel and their families — focusing especially on compensation, housing and medical benefits.

My third priority is modernization. We must develop and field new and upgraded weapons and supporting systems to guarantee the combat superiority of U.S. forces in the years ahead. The substantial reduction in force structure following the end of the Cold War allowed us to terminate or defer many programs within acceptable risks. This trend must now be reversed.

It is also important that we overhaul DoD's support elements and activities. We must make substantial progress on acquisition reform, streamlining infrastructure, re-engineering DoD business practices and more. The department's infrastructure and support activities must consume less of the budget without sacrificing the quality of support to the armed forces for my priorities to be met.

By ensuring the battlefield superiority of U.S. forces today and tomorrow, the entire defense budget supports the goal of attracting and retaining high quality military personnel. New recruits want to be a part of a winning team, and seasoned professionals want to be trained and equipped so they have confidence of success when called upon. The high quality of today's uniformed personnel is the result of many years of investment and hard work, and it can only be sustained by more of the same. Any proposed budget savings that would undermine the high quality of our military personnel would be false savings. Investments in people offer the greatest returns for America's defense dollars.

Providing a good quality of life for our uniformed personnel and their families is essential to sustaining the long-term quality of U.S. forces, as well as crucial to ensuring high readiness. Reflecting that reality, the fiscal 1998 budget includes strong support for military pay, housing, medical services and other important benefits for our personnel. The budget supports:

❑ Military pay raises up to the maximum percentage established by law. The fiscal 1998 budget funds a 2.8 percent pay increase; the outyears provide for 3 percent per year.

❑ Expanded use of the Family Housing Improvement Fund. To solve its housing problems more rapidly, the department is seeking to take advantage of private sector expertise and capital, which will result in greater payoff from our budgeted funds.

❑ The construction or modernization of approximately 11,000 barracks living spaces, with the majority of the new or modernized living spaces providing each unaccompanied service member with more room and a private sleeping area.

❑ Strong child care; family support, and morale, welfare and recreation programs.

Gen. John Shalikashvili, chairman of the Joint Chiefs of Staff, and I agree that U.S. forces are as ready today as they have ever been. The high readiness and quality of our forces is being demonstrated everywhere those forces are deployed or conducting exercises and training.

To ensure high readiness and quality, the new budget provides strong support for training, exercises, maintenance, supplies and other essentials needed to keep U.S.

forces prepared to carry out their combat missions decisively. This readiness-related spending occurs mostly in the department's operations and maintenance accounts. Reflecting the priority given to readiness, Operations and Maintenance is the only appropriation title given a dollar increase in the new budget: from $92.9 billion in fiscal 1997 to $93.7 billion in fiscal 1998. Within its own account, each military service will work to ensure high levels of readiness, while pursuing initiatives to reduce overhead costs.

It is important the department continue to take action to prevent unbudgeted costs of nonroutine operations, like those in Bosnia, from absorbing funds needed for readiness, modernization and other top priorities. To that end, the fiscal 1998 budget retains the practice of budgeting for all known military operations. The request includes $1.5 billion in fiscal 1998 in the Overseas Contingency Operations Transfer Account to complete planned operations in and around Bosnia. In addition, $.7 billion is included in military service and defense agency budgets for the continuing operations in Southwest Asia.

In its fiscal 1997 defense bill, Congress appropriated $1.3 billion to cover fully the costs of military operations projected at the time of the bill's completion. Since then, two developments occurred that now leave the department facing $2 billion in unbudgeted fiscal 1997 military operations costs. First, new provocations by Iraq last September increased the intensity of U.S. operations in Southwest Asia. Second, this past November, President Clinton approved participation of U.S. forces in a new phase of operations in Bosnia to further advance the goals of the Dayton peace accord. The administration is requesting a fiscal 1997 supplemental appropriation of $2 billion to cover these new projected costs. Of this $2 billion, $124 million is for Southwest Asia operations.

The administration is also requesting authority for the secretary of defense to rescind $4.8 billion in previously appropriated fiscal 1997 funds. The goal will be to target spending that is not expected to make significant contributions to U.S. military capabilities. The budget assumes $2 billion

of these rescissions would offset the fiscal 1997 supplemental appropriation request for Bosnia. The other $2.8 billion in rescissions is necessary to reach outlay targets.

The uncertainty surrounding most contingency operations makes them difficult to predict their costs. Therefore, budget development for such operations is less certain than for other parts of the defense budget. The department is intent on continuing to improve the speed and accuracy of its cost estimating for any future operations. That will help us fund these operations

U.S. Army helicopters ferry British scout vehicles during a combined forces exercise at Fort Bragg, N.C. The need for and ability of U.S. forces to conduct joint and combined operations, and coalition warfare, are key readiness concerns.

Lance Cpl. M.A. Sutherland, USMC

> **Our challenge is to make sure the department has a strong modernization program that is achievable and fully sufficient for America's security needs.**

through productive interaction with Congress and to keep them from undermining force readiness.

One final word on Bosnia: As I said at my confirmation hearing, I plan to work hard to help ensure the participation of U.S. ground troops in Bosnia will indeed end by June 1998, as planned.

Modernization

For several years, the Defense Department has been able to reduce its procurement of new weapons and upgraded capabilities without undermining the battlefield superiority of U.S. forces. The average age of military equipment has not risen substantially, partly because many new weapons were procured in the 1980s and partly because older equipment was weeded out as forces were drawn down. This decline in procurement spending has made room in the budget for robust funding for training, maintenance, quality of life and other components of near-term readiness.

Now, to ensure the long-term superiority of U.S. forces, it is necessary to begin investing in the procurement of new systems. Consistent with that goal, spending for procurement is projected to increase to $60 billion by fiscal 2001, a target amount and date that the Clinton administration first established in its fiscal 1996 budget. By fiscal 2002, procurement spending is projected to achieve real growth in excess of 40 percent over the fiscal 1998 level of $42.6 billion.

I plan to remain focused on this procurement spending target. Necessary adjustments forced us to set the fiscal 1998 target we have. Our challenge is to make sure the department has a strong modernization program that is achievable and fully sufficient for America's security needs. Modernization is one of the most important areas being analyzed in the Quadrennial Defense Review and one in which I will be intimately involved. The review will focus on the adequacy of DoD modernization programs as well as on the achievement of savings from operating and support activities — savings we can invest in modern weapons and

equipment and superior technology.

The DoD modernization program is multifaceted and forward-looking. To modernize the combat platforms of U.S. forces, two components are being pursued. First priority goes to leap-ahead systems. These are brand new systems featuring the most advanced technologies and designed to ensure future U.S. forces have the greatest possible battlefield superiority. Major leap-ahead systems include the Comanche helicopter, tilt-rotor V-22 aircraft, new attack submarine, F-22 fighter, joint strike fighter and F-18E/F aircraft.

Cost-effective upgrades of existing combat platforms also are important. Such upgrades will substantially increase the capabilities of U.S. forces at a much lower cost than for fielding new systems. Major examples are the CH-47 helicopter engine upgrade, AH-64 Apache Longbow, M-1 Abrams tank upgrade, M-2 Bradley fighting vehicle base sustainment, tactical vehicle remanufacture, AV-8B Harrier jet remanufacture and B-1B bomber upgrade programs.

Another modernization requirement is to expand and ensure battlespace information dominance of U.S. forces. The key goal here is to make combat leaders as aware as possible of the situation confronting them — most notably with regard to the enemy's size, location and activity. Major programs: Army digitization, unmanned aerial vehicles, Global Broadcast System, Cooperative Engagement Capability, and the Milstar and Space-Based Infrared System satellite programs. Also essential, the advanced concept technology demonstration initiative accelerates the introduction of advanced technologies into the systems of our operating forces.

Finally, the Ballistic Missile Defense Program is an essential component of DoD modernization plans.

The proliferation of weapons of mass destruction and the ballistic missiles that deliver them poses a major threat and must remain a major focus of U.S. defense policy and budget allocations. America must

pursue a robust ballistic missile defense program as part of a broader counterproliferation strategy to reduce, deter and defend against this threat.

As a senator I worked hard to narrow the differences between Congress and the Clinton administration regarding missile defense. In my new position, I am committed to advancing a missile defense program that is sound and executable and provides an effective defense against the threat. This budget incorporates changes to ensure that the department has a strong ballistic missile defense program, is allocating substantial resources to advance essential goals and is proceeding as rapidly as is technologically sound.

I will closely monitor all major aspects of the program. Its highest priority is theater missile defense, to meet the threat that exists now. The goal is to develop, procure and deploy systems that can protect forward-deployed and expeditionary elements of U.S. forces as well as allied and friendly nations from theater-range ballistic missiles.

In general, these theater defenses are structured to proceed as fast as technology risks will allow. Key programs include the Patriot Advanced Capability-3 missile, Navy Area and Theaterwide missile defense systems, Theater High Altitude Area Defense, Medium Extended Air Defense System, and Airborne Laser system. Among its features, this budget accelerates by two years the Theater High Altitude Area Defense program and the first launch of a Space and Missile Tracking System satellite, and adds funds to the Navy Theaterwide Defense program to reduce risk.

The next highest priority is development of a National Missile Defense program that positions the United States to deploy the most effective possible system to defend U.S. territory when the threat warrants such deployment. The program will develop all elements of a system in a balanced manner, achieving the first test of an integrated system by fiscal 1999. If the fiscal 1999 test is successful, the United States would be in a position, beginning in fiscal 2000, to deploy this initial system within three years of a

decision to do so, based upon the threat. After the fiscal 1999 test, until a decision to deploy is made, the program would be geared to improving the performance of the designed system by advancing the technology of each element and by adding new elements — all the while maintaining the capability to deploy the system within three years of a decision.

The third ballistic missile defense priority is the continued development of a technology base that improves the capability of both the theater and national defense programs to respond to emerging threats. These expenditures seek both to enhance the performance and reduce the cost of future ystems.

Fiscal 1998 budget authority requested for ballistic missile defense is $3.5 billion. For fiscal 1999 through fiscal 2003, an additional $17.9 billion is planned. This

LEAP-AHEAD SYSTEMS
Procurement and R&D
(Budget Authority $ Billions)

	FY 98		FY 99-03	
	QUANTITIES	DOLLARS	QUANTITIES	DOLLARS
Comanche Helicopter	—	.3	—	2.9
V-22 Tilt-rotor Aircraft	5	1.1	86	7.2
New Attack Submarine	1	3.0	3	7.7
F-22 Fighter	—	2.2	70	18.2
Joint Strike Fighter	—	.9	—	9.2
F-18 Fighter	20	2.5	228	18.0

COST EFFECTIVE UPGRADES
(Budget Authority $ Billions)

	FY 98		FY 99-03	
	QUANTITIES	DOLLARS	QUANTITIES	DOLLARS
CH-47 Engine Upgrade	24	.1	371	.9
Longbow Apache	44	.5	356	3.2
Abrams Tank Upgrade	120	.6	432	3.2
Bradley Base Sustainment	—	.1	—	1.9
Medium Truck SLEP	—	—	—	.6
AV-8B Remanufacture	11	.3	33	.9
B1-B Conventional Upgrade	—	.3	—	1.4

William S. Cohen

Sworn in as the 20th secretary of defense on Jan. 24, 1997, Cohen came to the position from Capitol Hill, where he had represented his native Maine in the House from 1973-1979 and in the Senate since 1979. He served on the Senate Armed Services and Governmental Affairs committees during his entire Senate tenure; he also was a member of the Senate Select Committee on Intelligence from 1983 to 1991 and 1995 to 1997, and was its vice chairman from 1987 to 1991. He was a board director of the Council on Foreign Relations from 1989 to 1997 and has served with numerous defense-related study groups and committees at the Center for Strategic and International Studies, School for Advanced International Studies and Brookings Institute. He holds a bachelor's degree in Latin from Bowdoin College and his bachelor of laws degree cum laude from Boston University Law School.

$21.4 billion total is $2.4 billion above what was projected by the department last year.

The new budget and Future Years Defense Program reflect projected savings from various sources. DoD civilian personnel are being drawn down, partly as a result of post-Cold War force structure reductions and partly because of management reforms. Excess inventories of supplies are being reduced. Acquisition reform is changing the way the department develops and procures new weapons and is making the process less expensive for both the department and its private contractors. Financial and personnel management systems are being consolidated and modernized, making them less costly and more responsive to both customers and DoD decision makers.

The department is identifying what goods and services can be produced more cost effectively by the private sector than by DoD elements and pushing to implement these changes as quickly as possible. Savings from such outsourcing or privatization initiatives are crucial to achieving robust funding of force modernization.
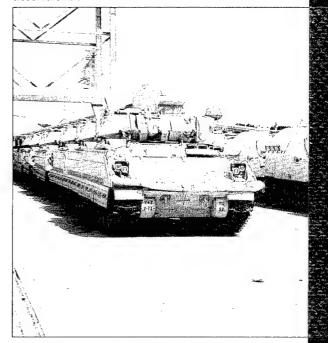
The department is continuing to carry out the decisions of the base realignment and closure process for streamlining defense facilities within the United States. Savings began to exceed implementation costs after fiscal 1996. The results from all four rounds of realignments and closures should be implemented completely by the end of fiscal 2001 and should provide a net savings of $1 4 billion for the years fiscal 1990 through fiscal 2001. After fiscal 2001, the costs avoided by having reduced and realigned the department's base structure will amount to about $5.6 billion every year thereafter.

In view of the significant demands on the defense budget, the department must continue to streamline, improve and reinvent its support activities wherever possible. The goal is to provide better products and services at reduced cost to U.S. forces and other DoD customers.

These are some major security challenges facing our nation and the ways in which the president's fiscal 1998 budget addresses those challenges. This year promises to be pivotal in the continuing task of adapting America's defense posture to the uncertainties of the post-Cold War period.

We are coming to the end of a century in which the United States played a unique role in defeating tyranny and aggression, nurturing open political and economic systems, and leading peoples of the world toward a better future. Much of that extraordinary achievement was based on the willingness of Americans to build and maintain extremely capable military forces. Now that the Cold War is over and freedom is becoming harder to suppress around the globe, America's defense challenges clearly are less daunting, but they remain substantial nevertheless.
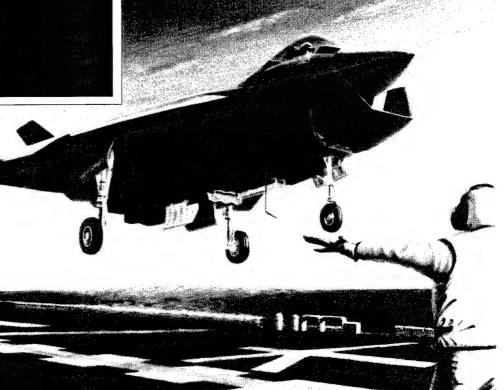
The greatest need is for America to skillfully fulfill its global leadership mandate. In an increasingly interdependent world, such leadership is critical to influencing the actions of others who could affect our national well-being. It is also key to creating the international conditions in which peace, stability, democracy and free trade can flourish. Let us therefore remember strong U.S. leadership continues to depend on sound defense policies and budget priorities, to which we now must focus our full attention.❖

Artists' conceptions depict new multirole Joint Strike Fighter designs championed by two competing contractors, Lockheed-Martin, **left,** and Boeing, **below, right**. The aircraft, a leap-ahead modernization effort, figures modestly from now through the fiscal 2003 budget — operational status is scheduled for 2008. **Below left**, rows of armored vehicles bound for Europe await loading aboard a freighter at the port of Savannah, Ga. Mobility — putting forces where and when they're needed — and sustaining them during contingency operations and other commitments are key DoD budget concerns.

Service, Low-Cost, Accuracy, Efficiency

THE DFAS

By Richard F. Keevey, Director, Defense Finance and Accounting Service

THE DEFENSE FINANCE AND ACCOUNTING SERVICE touches all service members and DoD civilians. Most people recognize us simply as the organization that pays them, but we do much more. We are DoD's accountant as well as its paymaster. From reimbursing you for travel and moving expenses to paying contractors for the supplies you use at work to paying those who service or repair your equipment, we are involved.

The magnitude of our workload is vast. The agency has fiscal control of a program larger than the combined annual sales of 264 Fortune 500 companies and 20 times the size of Coca-Cola. We process a monthly average of 9.8 million payments to DoD personnel and 2 million commercial invoices, disbursing $25 billion a month. Many agencies and organizations rely on us to implement a multitude of regulations and to collect and disburse funds. Foreign governments depend on us to account for their security assistance purchases.

BOTTOM

he Defense Finance and Accounting Service was established in 1991 to improve the quality of DoD finance and accounting operations and to reduce their cost. Under this charter, we consolidated military service and defense agency finance centers into one agency, with a headquarters in Arlington, Va., and major centers in Cleveland and Columbus, Ohio; Denver; Indianapolis; and Kansas City, Mo.
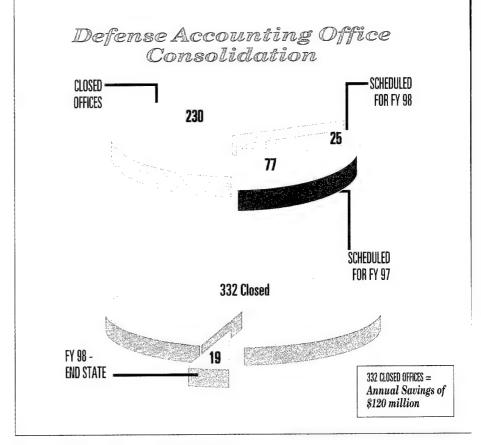
Before we were established, no one could accurately determine how much it cost to provide finance and accounting services to DoD components. We can now measure what they cost with an accuracy we never had before — about $1.6 billion in fiscal 1997. When we compare our costs to a 1992 baseline, we show $995 million in cumulative savings through 1997. Some of our largest savings are the result of our consolidation efforts.

Until consolidation began, the department's many financial systems operated from over 300 field activities in the United States. By November 1998, we will be down to five centers and 19 operating locations.

n addition, we have saved money by standardizing and reducing the number of finance and accounting systems. There were 324 finance and accounting systems in 1991, including 37 military and retired pay systems, 27 civilian pay systems, 10 contract/vendor pay systems and 197 different accounting systems to record, accumulate, report and analyze financial activity. We reduced the 324 systems to 217 at the end of fiscal 1996 and plan to be down to 32 by fiscal 2002.

The reduction of sites and the consolidation of systems will eliminate redundancy

Defense Accounting Office Consolidation

CLOSED OFFICES

230

SCHEDULED FOR FY 98

25

77

SCHEDULED FOR FY 97

332 Closed

FY 98 - END STATE

19

332 CLOSED OFFICES = *Annual Savings of $120 million*

and unnecessary management layers, improve and speed up operations and service to customers, and increase productivity. They will facilitate standardization and the expanded use of innovative technology, and they will enhance financial management support to DoD decision makers.

he Defense Finance and Accounting Service operates much like a business. We charge DoD components for each unit of work we perform. We must recover our costs from customers, and because our mission is to support them in their mission, we have a clear incentive to make our services less expensive and more

efficient. When we started consolidation four years ago, numerous skeptics thought we would fail, and they thought even if we succeeded, there would be a lot of problems. To date, though, things have gone very well — customers have been kept informed on all our efforts, and by and large, they like what we have done.

From a savings standpoint, consolidation alone will ultimately generate savings of $120 million per year; we already have savings of $65 million. Our latest program objective memorandum shows $800 million in reduced costs through fiscal 2003. This is in addition to the $995 million in savings we have already achieved. Savings will, of course, be passed to customers.

Electronic Commerce

Electronic commerce encompasses a wide variety of technological innovations that allow the Defense Finance and Accounting Service to conduct paperless financial transactions, saving time and money in the process.

Electronic data interchange is the computer-to-computer exchange of business information, such as invoices, bills of lading, receiving reports and contracts, in a standard, public electronic format. The agency uses electronic data interchange technology to redesign processes, eliminate paper documents and streamline disbursements. Using data sets codified by the American National Standard Institute, we ensure contractors can submit information electronically. About 10 percent of our invoices now are submitted in this way; our goal is 50 percent by the end of 1997.

We are making a major effort to expand use of electronic funds transfers, where we use direct deposits instead of issuing checks.

> TWO MILLION INVOICES COME IN EVERY MONTH. WE EXPECT ELECTRONIC DATA INTERCHANGE TO REDUCE THIS PAPER BURDEN. BUT WE ALSO NEED TO CONTROL AND MORE ACCURATELY TRACK DOCUMENTS FROM CREDITORS WHO DO NOT USE IT.

Our statistics tell a good and improving story: We use electronic transfers for 96 percent of all payroll, 45 percent of all travel reimbursements, 45 percent of the dollar value sent to vendors, 81 percent of the dollar value sent to major contractors who build and provide services for major weapon systems and 65 percent of the payments to other federal agencies, such as the Social Security Administration and Internal Revenue Service for income tax withholding.

But we can do better. Our goal is to do all payments electronically by 1999. Direct deposits save considerable money in postage and printing, and they are faster and more accurate. Customers and creditors know the money ends up in their accounts and does not get lost.

Two million invoices come in every month. We expect electronic data interchange to reduce this paper burden, but we also need to control and more accurately track documents from creditors who do not use it. We will be using electronic document management — some people refer to it as "imaging." This converts hard-copy data into electronic files that can be more easily routed for action and also easily accessed for later research. The documents can also be passed electronically to disbursing for payment — the system promises to change the way we pay vendors, manage contracts, handle civilian pay and administer travel pay, and it could cut processing times and costs by up to 25 percent. We are conducting two tests of this system now, in Omaha, Neb., and Columbus.

Electronic document access makes contract data available using a standard World Wide Web browser. In DoD, we routinely print an average of 18 copies of documents to administer a contract. Handling paper eats up scarce resources in terms of printing, filing and administration. By making contracts available electronically on an intranet server, any DoD contract specialist can access them on demand.

We just completed a business process re-engineering study of our garnishment operation in Cleveland. We handle 12,000

court orders per month totaling over $27 million for garnishment of pay from civilian and military personnel for child support, alimony, commercial debt and divisions of retired pay. We used to do garnishments in five different centers and at over 300 installations nationwide with no standard procedures. Now, the operation is located in just one center, and we have increased employee productivity by improving work flows and processing practices and introducing new performance measurement standards. Next year, we will introduce a new integrated garnishment system with imaging technologies that will further streamline the operation.

IMPAC Impact

The DoD comptroller's initiative to increase use of the International Merchant Purchase Authorization Card, or IMPAC, throughout DoD will produce major savings for our customers. The card streamlines purchase approvals, generates less financial documentation, reduces costs and speeds up vendor payments.

More than 200,000 government employees, over 84,000 in DoD, use IMPAC to buy supplies from commercial vendors of their choice, cutting through cumbersome acquisition procedures. Employees use IMPAC to buy office supplies, tools, equipment, periodical subscriptions and services. The card cannot be used for land or building rentals, cash advances, clothing, contracts that compete with existing federal contracts or mandatory telecommunication services. The rules are changing, however, and the trend is toward lifting many restrictions — one day soon, IMPAC cardholders may be able to purchase almost anything costing $2,500 or less, to pay for intragovernmental goods and services, and to pay for some commercial contracts.

New IMPAC cards will be issued beginning in April to the more than 84,000 DoD cardholders. DoD will switch from Rocky Mountain National Bank to its parent, First Bank. DoD users will see balance forward billing, convenience checks for those situations where vendors do not

Life in DFAS Lane

Over 175,000 Defense Finance and Accounting Service customers a month find answers to their questions at their fingertips. In January 1996, the agency launched DFAS Lane (www.dfas.mil), a World Wide Web site devoted to providing information about itself and to addressing subject matter experts in the field. Today, after nearly one year in existence, DFAS Lane sometimes sees as many as 10,000 customer "hits" a day.

At its inception, DFAS Lane was primarily a library of general information about the agency. Users could access press releases, biographies of key leaders and selected information about agency systems and policies. Users submitted questions to one e-mail address.

By studying incoming messages, the agency created a number of e-mail links dedicated to handling specific inquiries such as Army active duty pay, retired pay and vendor pay. Each center's public affairs office monitored and tracked the inquiries directed to its center and made sure experts fielded the questions.

The Defense Finance and Accounting Service also developed a Vendor Information Page on DFAS Lane, allowing vendors in the Denver Center network to obtain the latest information on their payments. The page is the precursor of the type of simple application that represents the future of the site. Users will be able to access the latest information, including leave and earning statements, without leaving their homes.

accept Visa cards, enhanced management reports and invoices at the approving official level instead of the installation or agency program coordinator level. The new card will be introduced incrementally; we will provide training for the estimated 1,700 DoD program coordinators in concert with the scheduled conversion. Conversion will begin with the Army.

The Defense Finance and Accounting

Service currently processes about 10 million commercial invoices per year; over three-quarters are under the card's $2,500 threshold. People who use the card can save a lot of money because a card transaction means we have to pay only the bank, not numerous vendors — thus reducing our costs and everyone's paperwork.

Up to now, we have often had 100 or more fund cites on one invoice, and that has required us to make an extraordinary number of entries to process a bill. Soon, however, we expect DoD components to use one fund cite, or line of accounting, per card. Components can make bulk obligations against those lines of accounting and charge their purchases against the bulk obligations.

We will only summarize lines of accounting into the accounting system and will bill customers for each line entered. Because we will only summarize invoice information, we will no longer track the details of each purchase. This does not mean more work for DoD, but less, because customers have usually reconciled their bills before submitting them. Because most customers already track and verify each purchase, the only real change is that they will reconcile transactions on a real-time desktop tracking system rather than wait to see them in our accounting or vendor pay system. It also means we will be out of the "check the checker" scenario. We are providing free tracking software and related training to all customers who do not already have their own system. Training is scheduled to begin in March.

In addition to using bulk obligations and summary-level accounting to cut costs, we will adopt a "prompt pay-delayed dispute" payment process. This means we will pay

THE NEW PROCESS WILL ALLOW TRAVELERS, SUPERVISORS AND COMMERCIAL TRAVEL OFFICES TO INTERFACE ON-LINE, PERFORMING ALL THE NECESSARY ARRANGEMENTS AND COMPUTATIONS IN ONE INTEGRATED PROCESS.

the complete total shown on an IMPAC invoice within 30 days of receipt without regard to disputes. Customers will have 60 days from the invoice payment date to dispute any charges with the vendor. If the customer finds an erroneous charge on the card statement, First Bank will credit the customer's next bill. This change eliminates late payments and resulting interest charges, which totaled more than $580,000 during fiscal 1995.

Effective Oct. 17, 1996, DoD Comptroller John Hamre directed all DoD components to designate certifying officers as responsible for certifying invoices and assuming financial liability for payments.

Another important ongoing re-engineering effort involves travel. This effort is headed by the comptroller, for whom the Defense Finance and Accounting Service provides extensive staff assistance. We are simplifying the process for temporary duty travel by DoD civilian and military personnel.
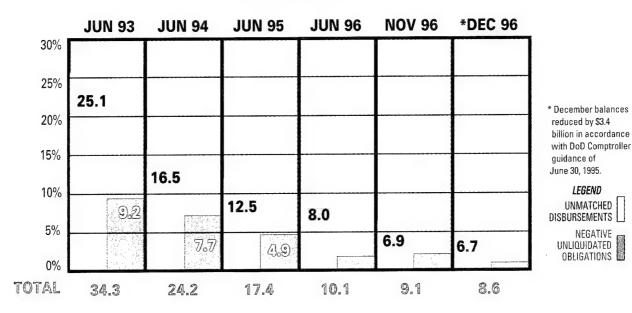
In the old days, travel meant maintaining logs of costs, nonavailability statements and paperwork to turn in for reimbursement. Financing and accounting was even more cumbersome. Numerous employees scrutinized every piece of paper for anomalies between what was spent and what was authorized.

The first step in the new process was to simplify the travel regulations. In fact, several have already been eliminated. Since October 1995, travelers have not needed to obtain paper nonavailability statements to justify reimbursement for commercial lodging and per diem expenses. In November 1995, DoD implemented electronic funds transfer to pay for travel advances and reimbursement for all military personnel; eased the threshold for the retention of receipts from $25 to $75; and instituted a standard 75 percent reimbursement for meals and incidental expenses on the first and last day of travel. DoD began to phase in direct deposits for civilian travelers in January 1996. As of August 1996, travelers were no longer required to submit receipts for rental car

Problem Disbursements — Baseline
($ IN BILLIONS)

	JUN 93	JUN 94	JUN 95	JUN 96	NOV 96	*DEC 96
30%						
25%	25.1					
20%						
15%		16.5				
10%						
	9.2		12.5	8.0		
5%		7.7			6.9	6.7
			4.9			
0%						
TOTAL	34.3	24.2	17.4	10.1	9.1	8.6

* December balances reduced by $3.4 billion in accordance with DoD Comptroller guidance of June 30, 1995.

LEGEND

UNMATCHED DISBURSEMENTS ▯

NEGATIVE UNLIQUIDATED OBLIGATIONS ▨

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expenses less than $75.

In addition to simplifying the entitlements, a special project management office was established to implement a process that will simplify the administrative burden of travel. A seamless, paperless process will begin in an 11-state region next year.

The new process will allow travelers, supervisors and commercial travel offices to interface on-line, performing all the necessary arrangements and computations in one integrated process. A DoD-wide common user interface will allow travelers to define their trip requirements and send them to the commercial travel office, which will make arrangements. The interface will develop an accurate "should cost" estimate the authorizing official can approve line by line.

Once travelers complete the trip, the system accepts actual costs and forwards the information to the authorizing official for approval. Travelers receive their reimbursements by electronic funds transfer and may even elect to have a portion of their settlement forwarded to the travel card company. This split disbursement should help travelers manage their finances more effectively and reduce delin-

quent payments to the travel card company. Random audits ensure the process works smoothly.

Show Me the Money

The civilian and military pay systems are very good already, but people sometimes complain because pay is about the most sensitive work issue imaginable. If it is not always correct, they justifiably get upset.

When the Defense Finance and Accounting Service was created, DoD had 27 different civilian pay systems paying 800,000 civilian employees. Our goal is to get to one pay system, and we are more than three-quarters of the way there. We pay 635,000 civilians using the Defense Civilian Pay System; all 165,000 remaining civilians will be converted to this system by the middle of 1998. The productivity of our technicians has increased from 400 accounts each to 1,800. We estimate overall savings at $80 million annually. This is a real accomplishment — reducing systems, increasing productivity, saving money. We have four pay offices: Pensacola, Fla.; Omaha; Charleston, S.C.; and Denver.

The same thing is going on in military pay. We pay over 2.6 million active and

reserve component military personnel. We inherited 22 pay systems, and our goal is to get down to two. We will retain the current Marine Corps Total Force System because it is an integrated pay and personnel system, but all other services will be on the Defense Joint Military System. The Army and Air Force are already on board, and the Navy should be by the end of 1997.

The services have found the standard defense system is more streamlined and efficient than theirs, and they are reaping the benefits — their shares of the $337 million we saved through consolidation. Service members are paid from the following locations: Army, Indianapolis; Air Force, Denver; Navy, Cleveland; and Marine Corps, Kansas City, Mo.

Recently, the Defense Science Board recommended we should have a single, integrated personnel and pay system similar to the system we operate for the Marine Corps. A study group has been formed to follow through on this recommendation, and we expect a new system to be developed, but it will probably take five to seven years.

We have also revised the retirement and annuitant system, which involved 2 million accounts, four locations and four systems. Cleveland now pays retirees, and Denver handles annuitants. In the past, one technician used to handle 2,000 accounts; now it is 3,500. We estimate the savings from consolidation and the introduction of imaging technology at over $10 million in annual operating costs. Further, if you are a retiree and you have a problem, you can call Cleveland, or Denver if you are an annuitant, and they can check the status of your account while you wait — all technicians have undergone training, so

> WE HAVE ALSO REVISED THE RETIREMENT
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> ACCOUNTS; NOW IT IS 3,500.

they are well-prepared to help customers.

There are still occasional pay glitches, but we try to fix problems as quickly as we can to ensure our customers' satisfaction.

Left Hand-Right Hand

"Problem disbursements" occur when expenditures have not been reconciled with official accounting records. There are two types: disbursements that have not been matched to an obligation and those that exceed the obligations to which they have been matched. Such occurrences are the result of a decades-old practice that allowed payments to be made before ensuring there was a clear path back to the appropriate accounting record. This practice is being phased out.

Problem disbursements in June 1993 totaled $34 billion; by November 1996, we had reduced them to $9 billion. Problem disbursements exist, in part, because of the way DoD used to do business. Payment systems were often separate from accounting systems, making it difficult to validate the obligation before paying the bill.

Although DoD's problem disbursements have been a serious issue needing remedy, there is no basis for concluding the expenditures were not valid. Each expenditure was made only after a department official confirmed receipt of the subject goods or services and ensured the payment was made in accordance with a valid contract. That safeguard has been scrupulously followed. The failure was in not having these valid and proper disbursements reconciled with accounting records in a timely manner.

To prevent future problem disbursements, the department will require every disbursement be prevalidated — that is, matched to an obligation before payment is made. Since July 1996, for contracts centrally managed by the Defense Contract Management Command and paid at our Columbus center, the prevalidation threshold is $4 million on contracts awarded prior to fiscal 1997. In addition, at the Columbus center all payments are now prevalidated to zero for new centrally

administered contacts awarded after September 1996. Prevalidation for all other contracts is, at a minimum, at a $1 million threshold.

Our ultimate goal is to validate all disbursements to zero, and this will be achieved when we have redesigned our major accounting systems and properly integrated them with our payment systems.

We are also exploring new approaches to the way we pay contractors, based on visits to some large companies and reviews of their business practices. Because current procedures require us to match a contract with a receiving report and invoice before payment, we sometimes delay payment and incur interest charges due to the lack of a receiving report from the customer.

To streamline this process, we are conducting a six-month test in Denver with the DoD inspector general whereby we pay contracts under $2,500 upon receipt of an applicable invoice. Later, we conduct a random audit to confirm that the contracted product or service was provided. But in the meantime, the vendor receives payment, which prevents late charges. Early test results have shown fewer than 10 percent discrepancies between the receipt and the invoice, and almost all have been resolved in the vendor's favor. In addition, we have reduced interest payments. If the test is successful, we will migrate this process to the rest of our operations.

Operation Mongoose

The Defense Finance and Accounting Service is enhancing customer service, reducing fraud, resolving payment problems and saving millions of dollars annually through Operation Mongoose, a combination of the latest technology and old-fashioned leg work. Before 1991, hundreds of disbursing offices nationwide paid bills using dozens of finance systems. There was no central program to detect improper payments.

Operation Mongoose is designed to ferret out and stop fraudulent and erroneous payments through a complex system of computer matches that spot anomalies in payroll, personnel and vendor pay systems. We and the Defense Manpower Data Center conduct these matches on records for vendor pay, civilian pay and transportation pay.

This initiative has achieved the most visible results in the field of retiree and annuitant pay. All retiree and annuitant pay records have been consolidated into the Defense Retiree and Annuitant Pay System. We conduct matches against that system, which ensures consistent results. In addition, we have also instituted a series of verification interviews with retirees and annuitants to ensure they are receiving the proper payments.

To date, interviews have focused on retirees and annuitants living outside the continental United States. Many countries and territories have inconsistent records, which make it difficult to ascertain when a retiree has died. The process unearthed many cases where family members have cashed checks addressed to deceased retirees. In most of these cases, the families are not acting in bad faith, but are unaware of the rules governing retiree and annuitant payments. By conducting the interviews, we have been able to identify payments to deceased members and inappropriate annuitant payments. As a result, the agency is recovering about $6 million every year.

The overseas interviews are conducted by agency employees with the help of deployed reservists. Many of these reservists are conversant in the native tongue of such countries as the Philippines, Spain, Italy, Germany and Japan. In addition to uncovering fraudulent payments, the Mongoose program is also able to provide valuable services to the interviewees — updating records and resolving pay problems. Because these retirees and annuitants live over-

seas, they can find it difficult to get answers to resolve pay problems. Operation Mongoose affords beneficiaries the opportunity to resolve their problems immediately. In some cases, Mongoose teams have helped retirees and annuitants recover thousands of dollars to which they were entitled.

Operation Mongoose is an "after the fact" process to detect fraud, but it also has the important agenda of reducing the vulnerability of the department's computer network to intrusion. DoD makes payroll and other types of payments amounting to billions of dollars every month. These payments are at a greater risk of fraud due to the tremendous increase in electronic interconnectivity and automation.

*M*any other federal agencies are partners in Operation Mongoose. Defense Finance and Accounting Service specialists often work together with representatives of the DoD Inspector General's Office, the Department of Veterans Affairs and the Social Security Administration. The Secret Service also supports the operation, while many other federal and state agencies have expressed an interest in participating.

INTERGOVERNMENTAL BUSINESSES SUCH AS THE DEFENSE FINANCE AND ACCOUNTING SERVICE HAVE TO SEARCH FOR WAYS TO PROVIDE FAIR AND COMPETITIVE SERVICES TO CUSTOMERS. WE TRY TO DO THIS BY REDUCING COSTS AND IMPROVING EFFICIENCY, AND ONE ALTERNATIVE HAS BEEN OUTSOURCING.

We have initiated a more defined training program for finance and accounting people. It is a certification program and has two main elements oriented toward employees in grades GS-12 to GS-15.

First of all, employees in that grade range will attend a two-week cornerstone program where they will learn strategic planning, statistical analysis and management skills. Our goal is to have all GS-12s to GS-15s go through this program. Then we want our management personnel to nominate about 5 percent of that group for

further training. These employees will have individual training programs developed and, before they are promoted to GS-13 or GS-14, will have received the training outlined in their schedules.

*T*he major goal is to identify the most qualified people in the grade range and get them into proper training programs. The program includes a rotational assignment, so someone at the headquarters can go to one of the centers and vice-versa.

In addition to providing training for our own employees, we want to make sure our customers are trained. For example, if you are a Navy employee who enters data into our accounting system, whether obligation data or contract data, we want you trained to do it correctly. Another example is transportation: Much data in the Defense Transportation Payment System relies on our customers' input, so we need to make sure they understand their responsibility.

Intergovernmental businesses such as the Defense Finance and Accounting Service have to search for ways to provide fair and competitive services to customers. We try to do this by reducing costs and improving efficiency, and one alternative has been outsourcing.

We study the feasibility of moving select finance and accounting functions to the private sector. The impetuses have been the Office of Management and Budget A-76 Circular, which directs federal agencies to compare in-house and private-sector costs; congressional requests; and internal management initiatives.

*T*he Defense Finance and Accounting Service is involved in six A-76 studies. Two have been formally announced — the Defense Commissary Agency vendor pay operation and the facilities logistics and administrative support review. Four others — depot maintenance accounting, transportation accounting, DoD Schools finance and accounting, and commissary agency accounting — will be announced in the coming months.

A seventh A-76 study, announced but discontinued due to an Internal Revenue

Service ruling, helped us identify the most efficient organization for our debt and claims management operation. Each year, five centers processed over 200,000 military and civilian debt cases where service members and civilians no longer work for DoD but owe the government money. We also manage more than 3,000 contract debt cases annually at the Columbus center. By consolidating our debt and claims management operations in Denver, we will save 200 work-years and $8.5 million annually — a 30 percent savings.

In the fiscal 1996 National Defense Authorization Act, Congress required a study on outsourcing the civilian payroll operation and the payroll and accounting functions for nonappropriated fund instrumentalities. The civilian payroll study was completed and briefed to the deputy secretary of defense, and the DoD inspector general is looking at the process used in the study. A final decision on what happens to civilian pay is forthcoming. The nonappropriated fund study was divided into two phases. The first is a six-month pilot with a private firm doing the civilian payroll function. Phase 2 will look toward outsourcing the accounting function after it is consolidated within DoD.

Two management initiatives have reviewed or are reviewing outsourcing opportunities. A "Big Six" accounting firm is the finance and accounting support contractor for the Defense Export Loan Guarantee Program, which backs private-sector loans to nations that buy or lease U.S. defense goods or services. The second is the continuing effort to re-engineer the travel function. Pilot tests at 27 sites will be completed within the next few months and are expected to provide the information necessary to begin outsourcing.

Not Over Till It's Over

All these initiatives have combined to make it possible for us to lower our rates to our customers. We project our rates will decrease each year for at least the next six years. But as successful as our streamlining effort has been, we still have too many accounting systems, and none has the proper functionality. We still lack final-stage accounting systems.

The military departments and defense agencies customized their systems to support their business philosophies and the practices existent at thousands of sites. They focused only on appropriation accounting and the recording of obligations and expenditures. These legacy systems do not do the kind of accounting necessary to prepare accurate and complete balance sheets and financial statements. To address this shortcoming and to expedite further consolidation of these systems, we recently created a project management office to focus on streamlining our accounting systems and analyzing the flow of data.

We are developing a plan to correct accounting and financial reporting deficiencies to be compliant with the Chief Financial Officers Act. For example, it was common practice to pay bills even though the accounts were in the red. We have stopped that. The assumption was that it was a bad accounting transaction that would ultimately be corrected. Now, if an account is in the red, we do not pay until we fix the problem.

We need standard, fully functional accounting systems for departmental accounting and for our various business systems. As we consolidate, we are identifying poor business practices and correcting them while also developing plans for standardized systems. We are trying to impress on our customers the importance of recording all financial transactions in a timely manner to the accounting records. For example, we found many examples where customers failed to record obligations but still expected us to make payments. This is simply not an acceptable way to do business and has been corrected.

We are working hard to overcome these problems and are making incremental improvements each year, but it will probably take until the year 2002 to get all the accounting systems fully developed. Making this happen is the biggest immediate challenge facing the Defense Finance and Accounting Service.❖

Richard F. Keevey

The Defense Finance and Accounting Service director since Feb. 5, 1995, Keevey immediately prior had been deputy under secretary of defense for financial management. He came to DoD by way of the New Jersey State Office of Management and Budget, where he had been the state budget director and comptroller for five years. He is a past public administrator of the year of the New Jersey chapter of the American Society for Public Administration and a recipient of the Distinguished Leadership Award from the New Jersey chapter of the Association of Government Accountants. An Army artillery officer from 1964 to 1966, Keevey holds an undergraduate degree from La Salle University and a graduate degree from the Wharton School of the University of Pennsylvania.

C⁴IFTW

TEAMWORK FOR THE WARRIOR

By LT. GEN. ALBERT J. EDMONDS, USAF, Director

NFORMATION SUPERIORITY — the ability to collect, process and disseminate an uninterrupted flow of information while denying our enemy that ability —will remain vital to our armed forces as we begin to realize the Joint Vision 2010. The vision provides an operational-based template for the evolution of our armed forces for a challenging and uncertain future. The monumental strength of our military has always been the unique core competencies of each service. The vision harnesses these skills and service strengths to achieve full spectrum dominance by conducting fully joint military operations.

With the lack of Cold War confrontation and with uncertainty and change as the only constants, more will be expected of our armed forces. Although we cannot predict future confrontations, the vision helps to plan for future possibilities by describing the global environment and by preparing our forces for the full range of challenges we may face. Simply stated, Joint Vision 2010 prescribes how we will fight into the 21st century, and it is the vision upon which Command, Control, Communications, Computers and Intelligence For the Warrior, or C^{4}IFTW, was formed.

The Defense Information Systems Agency's mission is to implement C^{4}IFTW. The agency's global work force of 7,350 civilian employees and 2,265 military members are committed to satisfying the warrior's quest for information to achieve victory for any mission from any location at any time. C^{4}IFTW is the map for creating a broadly connected joint system that will provide the warrior total battlespace information.

In implementing C^{4}IFTW, the Defense Information Systems Agency is constructing the Defense Information System Network, the Defense Message System, the Global Command and Control System and the Global Combat Support System. These are core missions and the pillars that will ensure warriors have global interoperability, assured communications, and command, control and computing services. Information security is integrated into each initiative from the beginning to ensure warriors can act efficiently and effectively.

The Defense Information System Network, Defense Message System, Global Command and Control System, Global Combat Support System and innovations in information security have great potential to more effectively fulfill the full range of tasks assigned to warriors of the future. As pillars in the Defense In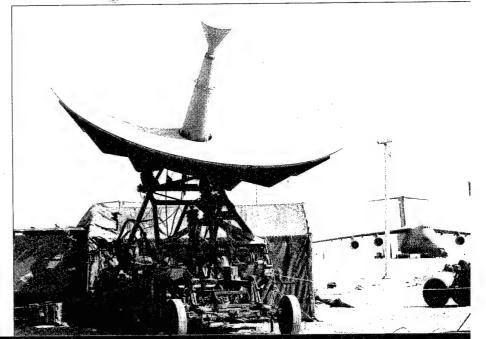formation Infrastructure, they will vastly improve the warfighter's ability to see, prioritize and distribute data to thousands of tactical and strategic locations. These initiatives are designed to provide significantly enhanced capabilities for the warfighter at reduced costs.

Along with the military services and defense agencies responsible for implementation and operation of the Defense Information Infrastructure, the Defense Information Systems Agency, as central manager, is executing the first step in C^{4}IFTW. The infrastructure is the seamless web of communication networks, computers, software, data bases, applications, data, security services and other capabilities that meet the information processing and transport needs of DoD users in times of peace and crisis. The agency is integrating hardware and software and constructing a common operating environment — standard communications applications, data and human-computer interfaces — that will enable execution of multiple mission and combat support applications to reduce cost, eliminate duplication and promote interoperability.

DoD Superhighway

Through the Defense Information System Network, the Defense Information Systems Agency is transforming the way information is transported, used and shared. The network consolidates more than 100 independent DoD networks into an integrated, cost-effective global "infosphere." It sets DoD

The ANTSC 93 Bravo mobile satellite terminal provides communications support to all U.S. personnel engaged in Operation Southern Watch in the Al-Kharj, Saudi Arabia, area.

on a course toward an open systems architecture, a global grid that will provide virtual connectivity on warrior demand. Its objective: information anywhere, anytime.

The network integrates satellite, airborne and terrestrial transmission assets and a combination of commercial and military media into a flexible information transport infrastructure that can accommodate new technologies that serve warfighters' needs. The seamless Defense Information System Network crosses strategic and tactical networks supporting joint and combined task forces as well networks of nondefense entities.

The network transmits a shared image of the battlespace among joint decision makers in a timely and coherent fashion — it provides the connectivity to support

o assure satellite capacity is available in key scenarios, the Commercial Satellite Communications Initiative gives DoD bulk discount rates and the right of first refusal where capacity is in short supply.

collaborative "smart push" and "user pull." It accommodates a variety of connections from high-data-rate fiber-optic cable to satellite communications with unmanned aerial vehicle relay backup to extensions for tactical use. These technologies and others provide near-instantaneous sensor-to-shooter connectivity that allows rapid exploitation of situational opportunities.

The network maximizes security consistent with threat, acceptable risk factors and cost effectiveness, and it makes use of any operationally available network assets at a given time for fulfilling the priority needs of the users. These assets include synchronous

optical network fiber-optic cable transmission and bandwidth managers, switched circuit and packet services, and teleconferencing services. The Defense Information System Network provides bandwidth services for wide, local and metropolitan area networks.

The Joint Broadcast System, a component of the Bosnia Command and Control Augmentation initiative, extends the network's high-capacity communications capability to U.S. and NATO elements in Bosnia. The augmentation includes a two-directional, high-bandwidth tactical internet and direct broadcast capability. The Global Command and Control System taps the Bosnia adjunct's large bandwidth and other capabilities to access imagery, maps and other information products. The system is being used to broadcast live video shot by Predators and other aerial drones in Bosnia. The Defense Information Systems Agency and U.S. European Command are examining the potential for commercialization of tactical assets in theater. The Defense Information System Network Support Services-Global contract, for instance, could provide operational support services and integrate a number of commercialization activities.

To assure satellite capacity is available in key scenarios, the Defense Information Systems Agency awarded the Commercial Satellite Communications Initiative in July 1995. This contract provides bulk satellite capacity at attractive rates and includes bandwidth management facility services to manage the space segment effectively and efficiently. DoD enjoys the right of first refusal in specific areas where capacity is in short supply, thus ensuring service during a crisis. First refusal rights give DoD time to execute a task order under the commercial contract or to execute a new contract. The contract has proven a valuable tool for supporting contingency operations.

The Defense Information Systems Agency is also leasing satellite terminals. European Command is using six terminals in support of Bosnia operations. Terminals are also part of the improvement program for U.S. forces in Korea.

The agency has awarded all four initial Defense Information System Network contracts. The first, Support Services-Global contract, was awarded to Boeing Information Services, Inc. and serves as network's technical management support vehicle. The second, covering stateside Switched/Bandwidth Manager Service, was awarded to MCI Telecommunications Corp. In addition to supporting the vast majority of all continental United states traffic, this contract also covers overseas traffic that starts or ends in the 48 contiguous states.

AT&T Government Markets won the last two: The Transmission Services-Continental United States contract will provide backbone and access area transmission services at T-1 and above bandwidth rates. The Global Video Services contract will provide multivendor interoperability, dedicated video services including secure and nonsecure, point-to-point and multipoint bridging, a reservation/scheduling system, video services management and monitoring, provisioning and user-site network interface equipment. The company also won the Defense Information System Network Hawaii Information Transfer System contract to provide wide-area and local networking services to DoD facilities within Hawaii.

Secure, Reliable Messaging

In a purely commercial environment, maneuvering successfully on the electronic superhighway can mean the difference between enrichment and maintaining the status quo. On the electronic battlefield, reliability and security determine success — the difference between dominating and merely surviving.

The Defense Message System provides DoD a mainline commercial-based, fully integrated, secure messaging capability. An important byproduct is standardized electronic mail capability. The defense system differs from commercial e-mail products primarily in that it brings elements of command and control to the desktop. The system will provide accountable and reliable messaging for the Global Command and

Control System and therefore will simplify C^4 on the battlefield.

The basic messaging components are the user agent (e-mail software), the message transfer agent and the message store. These parts allow users to create, send, receive and store X.400 messages. Because the system complies with international standards, it has standardized DoD while retaining the features and capabilities of the latest commercial e-mail systems.

The Defense Message System will be interoperable across multiple vendor platforms. The Defense Information Systems Agency will certify and integrate several vendors as compliant so users can choose their preferred desktop interface. The Defense Message System Compliance Handbook is posted on the agency's World Wide Web pages to allow vendors to incorporate requirements into their mainline commercial products, which the agency then tests for compliance and certification.

The system uses existing battlespace networks, not a separate transmission system. Messages move via communications networks and media, primarily the Defense Information System Network. Implementation of the message system target architecture will allow for the phase-out of the Automatic Digital Network by the year

Senior Airman Tim Schomaker of Robins Air Force Base, Ga., runs an equipment test on an ANTSC 93 Bravo mobile satellite terminal deployed to Saudi Arabia to provide communications support to Operation Southern Watch.

2000. It will also replace incompatible, unsecured e-mail systems. The Defense Message System provides users with organizational and individual messaging and directory services for both.

Defense Message System products, like other Defense Information Infrastructure applications, will run on distributed personal computer and/or client-server environments over the next few years. The X.500 directory and security management infrastructure put in place for messaging will evolve to support other functions such as electronic commerce/electronic data interchange. The X.400 message protocol will support textual messages, imagery, graphics, video clips and a wide range of other attachments. The agency expects the

he Defense Information Systems Agency will certify and integrate several vendors as compliant so users can choose their preferred desktop interface.

system to reduce the warfighter's cost and staffing requirements while enhancing messaging service and security.

The Fortezza cryptography card will provide Defense Message System users with writer-to-reader security. The PC Card device, inserted into a personal computer like a bank teller card, has an encryption engine and the user's private key. Fortezza enables originators to sign messages with a digital signature, which allows the recipient to verify the author's identity with complete confidence.

Each Fortezza card is unique to each user, and users must authenticate the card before accessing the Defense Message System. In addition to the user's private key, the card sets user privileges. These include information as to whether a user is an individual or represents an organizational authority (release agent), and the authorized precedence (priority, flash, etc.) and classification (e.g., unclassified, secret, etc.) levels of origination and release.

The Defense Message System contract was awarded in May 1995; the system is in operational testing and evaluation. The Defense Information Systems Agency centrally manages the program.

The agency has adopted, and the Military Communications and Electronic Board has approved, an event-driven fielding strategy with target dates. Major capabilities are being defined in terms of criteria matched to tests that provide quantifiable metrics. This approach applies Global Command and Control System lessons learned. With approval of the Major Automated Information Review Council, the Defense Message System has been installed at nine sites in three theaters, five government test labs and multiple pilot sites. The system is successfully exchanging signed and encrypted messages using Lotus, Microsoft and Enterprise Solutions Limited user agents and infrastructure components. More than 100,000 user agents have been ordered to date, and 215,000 users are projected to be in live operation by the end of calendar 1997.

Command and Control

The Worldwide Military Command and Control System served our nation well for 24 years. It served the military community and the civilian world as well. On Nov. 18, 1978, the world rocked with the mass suicide of 911 members of the Jim Jones People's Temple in Jonestown, Guyana. Immediately, the Joint Chiefs of Staff activated an intercomputer network teleconference on the system to support and coordinate an emergency operation as supplies, personnel and aircraft converged at staging areas and headed for Jonestown.

Even with its success, the system's technology became outdated and its increased cost led the way for DoD to find a successor.

On Aug. 30, 1996, the Defense Information Systems Agency officially pulled the plug and the Joint Staff concurrently declared the Global Command and Control System as the joint command and control system of record.

The new system is far more than a replacement. Deliberate and crisis management is just a small part of what the Global Command and Control System brings to the table. It can exploit new technologies as enablers to provide warfighters with advanced command and control capabilities. It provides intelligence analysis and support; tactical planning, tactical execution and collaborative planning; and has elaborate communications processes and networking of information using electronic mail technology.

The Global Command and Control System uses an integration standard and migration strategy that eliminates the need for inflexible stovepipe command and control systems and expensive duplication. This ensures interoperability, minimizes training requirements and allows efficient use of limited defense resources. It uses standard commercial hardware and software to provide a single, seamless command and control structure from the National Command Authorities down to the deployed commander.

The system uses client/server architecture with commercial, open systems standards for both standard commercial and government applications. The system approach focuses on developing the Defense Information Infrastructure common operating and data environments as well as shared services that enable interoperability between command and control applications and data.

Warfighters using the system can selectively push and pull the information they need to respond and coordinate horizontally and vertically during any mission. The system is a prescription for more agile, faster-moving joint operations. It provides automated decision support to key warfighters across the full range of military operations. Importantly, the 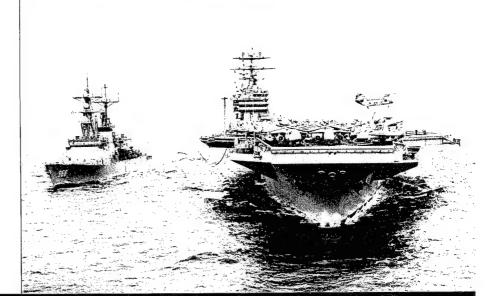system helps warfighters store, recall and fuse data to produce the minimum essential information necessary to support requirements throughout the entire joint force. Most importantly, it gives the warfighters a fused picture of the battlespace.

The Global Command and Control System gives warriors the same kind of "plug-and-play" they get with the operating systems running on their home computers. Diverse service systems will operate at any Global Command and Control System location with a consistent look and feel. The Defense Information Systems Agency distributes system applications by posting them on a secure web server. Sites pull them down and then use point-and-click set-up tools to install them into their systems.

The integration process is defined in the integration and run-time specification the agency has published. If warriors build their applications in accordance with the specification, software tools will automatically insert applications into the common operating environment and deconflict them

C⁴I For the Warrior promises U.S. commanders unprecedented knowledge of the battlespace and command of their forces, whether they be on the ground, at sea or in the air.

with other applications. The integration and run-time specification were designed to allow adaptation of current and emerging technologies such as object-oriented technology, C, C++, 3rd and 4th generation languages, web and relational technology, as well as Ada 83 and Ada 95. The system provides warfighters with surveillance, reconnaissance and the precise location of dispersed friendly forces with the ability to direct those forces within the battlespace. It has a dynamic, flexible structure and provides access to global intelligence sources, which gives warriors insights into exploitable opportunities. The system provides the president and the secretary of defense with similar advantages, augmenting their ability to make accurate and timely strategic decisions.

The Global Command and Control System incorporates the core planning and assess-

he Global Command and Control System provides warfighters with surveillance, reconnaissance and the precise location of dispersed friendly forces with the ability to direct those forces within the battlespace.

ment tools the Joint Chiefs, combatant commanders and their subordinate joint force commanders need to meet the services' readiness support requirements. The situational awareness it affords at the operational level helps commanders build the appropriate mix of forces and then maintain them, their capabilities and their operations.

The system is fully operational at 37 unified command and component sites, and at over 500 additional sites worldwide. It is networked through the Defense Information System Network. The system was successfully used during Operation Uphold Democ-

racy in Haiti, and it is now deployed with the U.S. peacekeeping force in Bosnia. The system also provides warfighters in the Persian Gulf with a near real time operational picture updated from multiple tactical and intelligence sources.

The Defense Information Systems Agency, Joint Staff and the Office of the Secretary of Defense are developing a postinitial operating capability acquisition strategy for the system that uses the integrated product team process within a streamlined, evolutionary framework. The agency has fielded Version 2.2 and will field Version 3 in fiscal 1997, increasing functionality and building upon the information infrastructure's environment.

Advanced Combat Support

The Global Combat Support System is a warfighter-focused strategy that will fuse procurement, logistics, personnel, medical, transportation, financial and reserve functions to provide rapid crisis response, en route asset tracking and shifting, and tailored sustainment at the strategic, operational and tactical levels. The Defense Information Systems Agency is implementing this strategy through an initiative that provides the infrastructure needed to interface and integrate combat support applications.

The global system will be fully adaptive to the needs of dispersed, mobile forces, providing support in minutes, hours or days instead of weeks.

The strategy will support the impetus of combat support from the continental United States into the theater and forward. Total asset visibility will allow logistics managers to obtain and act on information such as the location, quantity, condition and movement of equipment throughout the storage and supply chain. Importantly, the support system will provide continuous automatic push or pull requisitioning. Deployed forces will require less continuous support with a smaller combat support footprint; this will decrease the vulnerability of combat support lines of communication.

Like the Global Command and Control

System, the support system initiative is based on mainline commercial and government software products. The two share the same technical infrastructure. The support system builds on the technical developments and products, procedures and integration strategies that have been employed in the command and control system. They both use the Defense Information Infrastructure common operating environment and the same integration process and tools. This will allow users to get to all applications they need from a single terminal at a given security level.

Instead of the services developing and fielding complete systems independently, the agency will provide the operating environment for adoption by the services. Numerous military applications will be hosted on any equipment with an operating system that meets the common operating environment.

The initiative will achieve functional interfacing quickly. Global Combat Support System will become hardware independent and interoperable through incremental improvements and heavy participation using software that best meet the requirement. The system is evolving toward a commercially based open system environment that supports crossfunction, cross-service interoperability; it will provide interoperability across combat support functions and between combat support and command and control functions. Consequently, it will reduce the number of combat support systems needed to deploy and sustain a joint task force.

The support system will be fielded in increments to match increasing user communities and the addition of new products to the common operating and data environments. In a broad implementation strategy, the agency is building a little, testing a little and fielding a lot.

The first steps, already under way, will identify candidate users and functional proponents and build partnerships. The agency believes opportunities exist to save the department money by simply applying the Global Command and Control System

philosophy and communication standards to the combat support environment. The agency can gain from its partnership with functional area central design activities that code their applications to the common operating environment to help save money; using a standard data elements to ensure their portability across applications (integration); and using the same communication pipes, which conserves bandwidth and provides a faster, more efficient communications infrastructure.

Technology and the common operating environment have enabled the agency to integrate functions instead of systems, capitalizing on commonality between one functional domain and another. Common support like mapping and weather applications will be overlaid on a computer screen that can access all information and applications users need. Users will load military applications as they would load software on a home computers. The applications will not necessarily be built or provided by the Defense Information Systems Agency; anyone can build them. The combat support and command and control systems' install program creates directories, allocates memory, posts files, makes sure the correct libraries are present, and when complete, warfighters have an icon on their screen and are ready to go to work.

The Global Combat Support System, like the Global Command and Control System, provides a shared infrastructure and data base environment upon which applications can be integrated. The Global Data Management System and Workflow Manager are two examples. These components are being integrated into the common operating environment and will support critical infrastructure requirements for data exchange and workflow across functional areas.

The Defense Information Systems Agency is expanding the capabilities available to the combat support user world by adding a Global Combat Support System web that will incorporate off-the-shelf World Wide Web technologies — home pages, search engines, locator capabilities, newsgroups

and other technologies. It is a low-cost, low-risk approach to interfacing into the combat support system rapidly and effectively and is scheduled to be in operation by May.

For the first time, a joint task force commander can see the assets available from each service. The Defense Information Systems Agency also demonstrated "Events Logbook," a tool developed by the U.S. Transportation Command to keep an electronic, multimedia "log" of messages, information, graphics and all the material needs to trace command center actions and ensure there is an accurate report of these events. During the Joint Warrior Interoperability Demonstration '96, the Global Combat Support System was used to locate equipment parts as well as the availability and

he agency is integrating and applying operational, engineering, intelligence and security disciplines to ensure the availability, integrity and confidentiality of information throughout DoD.

location of personnel who spoke a particular language. During the 1997 demonstration, both the command and control and combat support applications will be demonstrated at a single work station.

The Defense Information Systems Agency is working with the Joint Staff J4 directorate to establish the requirements and priorities for support system applications and setting up the management process for the J4 proponency of the system. The agency is also working closely with the Theater Medical Information Program, which will focus on medical support to the warfighter.

The Defense Information Systems Agency has nearly 30 initiatives, spanning logistics, medical, finance, acquisition and procurement, and covering both in-theater operations and U.S. sustaining base, which are under way and will result in fielded Global Combat Support System capabilities within the year.

Information Security

The Defense Information Systems Agency is protecting the Defense Information Infrastructure from deception and destruction so warfighting combatant commanders can fight more effectively. The agency is integrating and applying operational, engineering, intelligence and security disciplines to ensure the availability, integrity and confidentiality of information throughout DoD. It is integrating multilevel security products, such as Fortezza, at both the application and core infrastructure levels. It is installing firewalls and guards, prototyping multilevel security products, performing vulnerability assessments on systems and, in support of the DoD Information Warfare-Defend Program, developing smart tool kits for systems administrators to protect against, detect and react to threats. It has installed network monitoring systems on DoD networks and is incorporating the intrusion monitoring data from the unified commands, services and agencies within the Defense Information Systems Agency Global Operations and Security Center.

The agency provides a round-the-clock Automated Systems Security Incident Support Team that cooperates closely with the services and the National Security Agency for rapid response to all information security events.

The Defense Information Systems Agency and the services assess defense systems to identify vulnerabilities and implement fixes. The agency issues the defense operating environment in several versions of UNIX and Windows NT to provide a standard configuration baseline that can be secured against attacks.

These efforts will help the agency categorize security vulnerabilities, dissuade

hackers and gauge the relative security health of the Defense Information Infrastructure. As the central manager of the infrastructure, the Defense Information Systems Agency, in cooperation with the National Security Agency, defines its requirements and implements them. The Defense Intelligence Agency supports these activities with threat assessments. Coordinating with these other activities, the Defense Information Systems Agency is certifying systems that are a part of or interact with the information infrastructure, and it is working toward providing a standard certification process across DoD. Right now, the Defense Information Systems Agency provides security policy, accreditation and Defense Information System Network connection approval, and it performs compliance validation of systems connected to the infrastructure.

The Defense Information Systems Agency has a close and trusted relationship with industry, specifically major telecommunications companies, through the National Communications System, the Network Security Information Exchange and the Forum for Incident Response Security Teams. The agency also works in partnership with other government agencies and nations to develop effective security policies and low-cost, standards-based solutions.

The agency is spearheading DoD's effort to increase information security awareness and education by developing courses for training systems administrators, information systems security managers, information systems security officers and users, and promulgating them through other federal departments and agencies. The agency facilitates this effort as vice chair of the DoD Education, Training and Awareness Working Group and participating in the education, training and awareness efforts at the national level through representation on the National Security Telecommunications and Information Systems and Security Committee and Security Policy Board's Training and Professional Development Committee. To support these efforts, the agency established the DoD information security training

facility, which provides instruction to personnel in the National Capital Region.

The Defense Information Systems Agency is covering all aspects of Information Warfare-Defend from policy and training to systems analysis. It is the vice chair of the assistant secretary of defense for command, control, communications and intelligence's Information Assurance Group. The group includes the Education Training and Awareness, DoD Multilevel Security and DoD Joint Information Assurance Tools working groups. The Defense Information Systems Agency and National Security Agency co-chair the fourth working group, which focuses on Information assurance policy.

The Defense Information Systems Agency, in support of the President's Critical Infrastructure Protection task force, participated in the utility subgroup and will be a contributor on the Defense Information Infrastructure subgroup. The agency participates in the policy under secretary's Infrastructure Assurance Analysis Working Group.

The Future

Accommodating sweeping technological change and revolutionary DoD requirements is a tremendous opportunity for the Defense Information Systems Agency and its service partners. The agency is aggressively working to ensure information systems are not just maintained but enhanced for the warfighter. Working as a team, the agency and the services will meet the goal of providing the warrior with pre-eminent support across a broad spectrum of needs.

Last year, the agency was with our nation's warfighters in Bosnia, the Arabian Gulf, Haiti, sub-Saharan Africa and along the Pacific Rim, ensuring that they had the information technology support they required to execute their missions. This year, it will work closely with warriors to maximize support, find innovative solutions, and aggressively reduce their expenses. The Defense Information Systems Agency will continue to enhance the way it does business while increasing access to information and improving the speed and accuracy of prioritizing and transferring data.❖

Lt. Gen.
Albert J. Edmonds
The director of the Defense Information Systems Agency and manager of the National Communications System since July 29, 1994, Edmonds joined the Air Force in August 1964 and earned a commission through Officer Training School in November 1964. A career communications officer, he has served in Virginia, Hawaii, the Pentagon, Thailand and Guam. He was Joint Staff director for command, control, communications and computer systems from September 1991 until his current assignment. He holds a bachelor's degree in chemistry from Morris Brown College, Atlanta, and a master's in counseling psychology from Hampton (Va.) University. He is a 1980 distinguished graduate of the Air War College, Maxwell Air Force Base, Ala., and his decorations include the Defense Distinguished Service Medal, Defense Superior Service Medal and Legion of Merit.

Surfing Society's Third Wave

HE EMERGENCE of communications and computer networks offers us tremendous opportunities for changes that will benefit mankind. Contemplate for a moment, however, a future in which there are no secrets. Imagine that anyone can discover almost everything about you that you consider private — your spending habits, your school report cards, your medical history.

BY

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DEPUTY DIRECTOR,
NATIONAL
SECURITY AGENCY

Image there are no business secrets — intellectual property is unprotected, market strategies are known by your competitors, and corporate weaknesses are known to all.

This in not the kind of future I want to see. A society without information safeguards would be harmful to the privacy of U.S. citizens, the competitiveness of U.S. business and, ultimately, the national security of our nation. So let us consider the tremendous challenges this nation must address to ensure a smooth transition to an information-based society.

Futurists Alvin and Heidi Toffler describe society's evolution in three "waves": agriculture-based, industry-based and information-based. They maintain today's leading powers have evolved from agrarian nations into industrial ones, and now, many industrial nations are evolving into information societies.

The United States prospered within the first two waves and is certainly on the forefront of the third wave. In fact, many believe the prospects for the United States in the information society of the 21st century are far greater than what we experienced as a nation during the industrial wave of this century.

Information security, or the lack of it, has the potential to determine whether we simply ride the third wave to see where it takes us or we maximize the opportunities the information age offers. The results might be very different.

I'd like to see the robust development of information security and, with it, information security professionals to help the country surf the third wave — that is, help establish information security policies, products and services that become ubiquitous, inexpensive and easy to use. Information security will be a deal-maker as we transition to an information-based society. This transition won't be an easy task.

The National Security Agency has long played an important role in implementing information security to produce the safeguards that control our nuclear arsenal and enable our military commanders and policy makers to communicate securely anywhere in the world. But the expansion of networks and information technology beyond the traditional government and the military sectors into the global business network means industry will lead the way into the information age. Information technology and information services dominate domestic business sales and are already a leading export, but many of these

commercial information products and services are not proliferating as they otherwise might because of their lack of security.

For example, consider electronic commerce. Inexpensive information technology, ubiquitous networking, public key encryption, the needs of customers and the imperatives of business competition make electronic commerce inevitable. Despite its huge potential, however, electronic commerce has grown remarkably slowly, primarily because of the lack of security needed to instill confidence in its use. Information security is paramount for successful implementation of electronic commerce. The net without security takes us back to the days of the telephone party line.

The White House recently defined a policy initiative designed to accelerate the growth of cryptography as a security enabler. Some believe the administration's initiative is about key escrow and export controls, but in the broadest sense, the initiative deals with preparations we must make as a nation to use information technology to its full potential by implementing proper security protocols.

The administration policy transcends the key escrow issue. It focuses on the more fundamental question of key management infrastructure. In other words, it is an attempt to create an environment in which an international framework will grow to support use of strong encryption to protect private, business and government interests. Although it will be difficult to move this initiative from concept to reality, it is critical that we do so, and quickly.

To provide security in a networked environment, we will need to resolve a complex and interrelated set of issues pertaining to trust, scalability, liability and risk, availability of service, and public policy.

Let me give you a sense of the level of trust in our systems today. According to a survey by the accounting firm of Ernst and Young and Information Week magazine released in early October 1996, 71 percent of the 1,300 senior information executives surveyed expressed lack of confidence in the security of their computer networks. Over three-quarters had experienced losses within the past two years due to problems with information security, computer viruses and disaster recovery.

There is much more to the issue of trust than a good encryption algorithm. Without an effective security infrastructure to implement it, an encryption algorithm value is comparable to that of a bank vault door on a cardboard box.

Trust in a system begins with the encryption algorithm and goes far beyond. Trust encompasses not only the strength of the encryption algorithm but the integrity of those who:

▪ Issue the public key certificates that vouch for your identity and the identity of those with whom you deal;

▪ Build the directories that allow others to know how to communicate securely with you; and

Assist you if you believe your encryption key or certificate has been compromised or lost.

Can we build that level of trust into an infrastructure big enough to support electronic commerce on a global basis? The answer to that is, "We must!" Encryption has little chance of being used to its full potential, here or overseas, until such a trusted international framework is in place.

How do we scale up to a global system while maintaining trust? Many of us have experience in building limited segments of a management infrastructure for a business, a business sector or a part of the government.

The National Security Agency and the Department of Defense have a great deal of experience in building security infrastructures for critical functions like nuclear command and control and military operations worldwide. We are currently building the key management infrastructure to support 2 million users of the Defense Message System to provide e-mail and browser services to DoD users, but we have yet to tackle the issue of support for electronic commerce with the 860,000 vendors who do business with the Department of Defense.

The complexity of these efforts pales in comparison with putting together a key management infrastructure for all applications — private, public and military — in a global, networked environment. Unanswered questions abound in this area. For example:

Who defines what constitutes a trusted issuer of certificates?

How do we limit authorities of certificate users?

Are we ready to certify all users for all applications and all types of transactions?

Are we ready to cross certify from any nation? All nations?

To use certificates with confidence — that is, the way we use paper currency and signed contracts today — we will need to track the certificate authorities globally and with complete trust. Making trust scalable will be one of the most difficult challenges of the information age.

What happens when something goes wrong, for example, when a user trusts the infrastructure, follows its procedures and loses information or money? Whose fault is it, and who makes good the loss?

Risk is inherent in networking. With the best precautions, in a networked environment some risk will always remain. With information technology advancing dynamically, today's effective solution will be obsolete tomorrow. The situation is made more difficult by the competitive imperatives driving us toward electronic commerce. Electronic commerce cannot wait until the perfect infrastructure is put in place.

The next stage of electronic commerce takes risk to a new plane. It must protect billions of transactions ranging from simple credit card purchases to large-scale electronic transfers of funds and proprietary information.

To use networks, we must accept some risk and manage it. Part of risk management will require us to take a hard look at the issue of liability. How do we set limits on liability while maintaining trust?

Another challenge we face with the increased dependency on computers and communications technology is network availability. Consider the medical community's use of information technology for telemedicine. Using the network in the field of medicine has tremendous potential to globally unite specialists and patients. It can, literally, be a life saver. But the users of telemedicine's information technology must be able to count on its availability. Denial of service is unacceptable.

We are now in a national discussion on how to balance the interests of individuals' and businesses' privacy with society's public safety interests in law enforcement and national security. How we resolve this dichotomy will

shape the structure we build to implement our security solutions, an infrastructure that will have key management as its foundation.

If we overemphasize public safety and security, we risk a world with too much government access at the cost of individual privacy. If we overemphasize the privacy issue, we risk a world with perhaps too many secrets — for example, a world in which terrorists, organized crime and hackers acquire secure command, control and communications capabilities with a degree of privacy formerly available only to advanced military forces. Both of these extremes are unpalatable. We need to strike a balance that provides adequate protection for both individuals and businesses and for society as a whole.

As a matter of public policy, the administration is pursuing establishment of a key management infrastructure with a feature called key recovery. One fundamental question on this issue is whether to include a key recovery feature. Key recovery would add complexity, and arguments have been advanced to support proceeding without it. There are, however, three very good reasons for designing key recovery into the key management infrastructure.

First, key recovery is good business practice. It protects information from loss by allowing users to regain access to their encrypted data when encryption keys are lost or corrupted. Key recovery is analogous to systems administrators recovering forgotten passwords or individuals maintaining spare house or desk keys for emergency use.

This goes back to the trust issue. Key recovery will help ensure availability of information and systems by avoiding lockout and by guaranteeing authorized access to information, thus increasing the level of trust in the security system.

Second, key recovery makes it possible for law enforcement, with proper authorization, to access the keys. This is an essential component of a solution that protects the public interest. There is a clear societal interest in preventing cyberspace from developing into a sanctuary for global, instantaneous and secure centers of operations for criminals, terrorists and rogue nations.

Finally, key recovery may prove essential in making encryption scalable on an international basis. We are not the only country wrestling with the public safety implications of unbreakable cryptography. France, Israel and Russia recently imposed import and domestic use restrictions. Several Asian, South American and African countries have had similar restrictions in place for years. Others may impose them as strong cryptography proliferates.

For many overseas, as well as here, the logic of the need to balance business imperatives with public safety concerns argues for key recovery. The European Union and other confederations are considering key recovery-based key management infrastructures. The world's major standards bodies are designing future standards so key recovery can be accommodated.

International standards and protocols for key recovery may prove essential to hand off national restrictions on strong encryption, to promote a broad export market for cryptography, and to establish a key management infrastructure acceptable for general international use. This would accelerate the realization of the promise of information technology, and that would be in everyone's best interest.

Working in partnership, government and industry together need to lay the foundation necessary to sustain and strengthen information security for America. I wish to emphasize the key management infrastructure will be built by industry as a commercial venture. This task is huge. Collaboration among many partners will be essential if we are to establish an infrastructure that promotes the use of encryption worldwide.

Security is essential to successfully navigating the information age. We must build the foundation components of trust, risk and liability, scalability, availability and policy that must accompany encryption to build real security into systems. Information security professionals will play a critical role in making this a reality. We are facing a tremendous challenge during the transition to an information society, and we can only succeed by working collaboratively to keep ahead of the breaking crest of the third wave.❖

William P. Crowell
Crowell was appointed deputy director of the National Security Agency on Feb. 2, 1994. He has served in a variety of agency positions since joining in 1962, more recently as the agency's chief of staff from July 1990 until becoming deputy director of operations in October 1991. His career includes a break from November 1989 to June 1990, when he was an officer of the Atlantic Aerospace Electronics Corp. Crowell holds a bachelor's degree in political science from Louisiana State University. He received the Meritorious Civilian Service Award in 1972 and 1981, the Presidential Rank of Meritorious Executive in 1984, the Exceptional Civilian Service Award in 1986, the President's Distinguished Executive Award in 1991 and the National Intelligence Distinguished Service Medal in 1995.

STAYING READY

An interview with *Deborah R. Lee,*

After nearly four years as assistant secretary, what are some of the biggest successes you've seen in terms of the reserve components?

I would say we have taken on a number of themes and a number of issues, and I feel quite satisfied we have done well with them. We still have a way to go, but I think we've had some solid accomplishments.

Obviously the first issue was a macro Department of Defense issue, and that was downsizing. We were determined to do it right, to be fair to our people and, at the same time, at the end of downsizing, to make sure we were a highly ready and effective force.

Downsizing is almost over. We've provided transition benefits to those who left us to try to fulfill the promise of protecting our people. At the same time, the people who remain are highly motivated, highly educated and the best qualified; they are superb individuals for the force that remains. And we are in fact ready. So I feel the downsizing, hard though it was, was done properly.

Second, we took on the theme of increased use of the Guard and Reserve in the post-Cold War environment. That is, they're not solely a backup force of last resort in an all-out war. Rather, we're using the Guard and Reserve more and more in a spectrum of operations short of war. We felt this made sense from the taxpayers' standpoint because the Guard and Reserve are less expensive to maintain in peacetime than their active duty counterparts. It also made sense from the standpoint of making best use of all your assets. So, in fact, we have used the reserves more, and they have been effective. They have done a terrific job in every operation and every joint exercise.

They've performed superbly.

I remember access being one of the major issues and concerns brought to my attention when I came into this job. Could we gain proper access to the reserve components if we needed to do so? Meaning, would the president really call them up? Would we get enough volunteers if we needed them for duty? Could we really ask people to go to joint exercises for three and four weeks vice two weeks? Again, the news has been very, very good.

I do not hear from our leaders any more about concerns on access. The reason, I think, is the president has called up the reserves when he has been advised to do so. We have gotten superb volunteerism, particularly on the side of the Air Force, when we've needed to do so. The reserves have made themselves available for longer exercises, meaning three to four weeks rather than the customary two weeks' active duty training. I think the way we used the reserves in the last few years is a great success story. The reserves have gotten good training, and they've also helped reduce some of the active duty personnel tempo.

The next theme we took on was reserve component readiness. The key objective to me is to achieve optimum wartime capability while helping the active force complete its peacetime work. Although there are many ingredients to readiness, military experts agree two are particularly essential — top-notch training and equipment.

These past four years we have taken a nontraditional look at training. One approach has been to provide training in real-world settings. That was the focus of [former] Secretary William Perry's increased-use initiative, in which the commanders in chief and the services have

made greater use of the reserve components, usually through extended annual training, to help relieve the personnel tempo of active duty units.

Another nontraditional way to conduct readiness training here at home has been through innovative readiness training programs, which are coordinated by my office. We have also recognized the aggressive use of technology can help us revolutionize the way we train, reduce our long-term costs, maximize the time we have available for training and deliver a high-quality product to a geographically dispersed population.

It has also been our goal to equip the reserves with modern, compatible equipment that enables them to do their job side by side with the active force and coalition partners. To meet near-term challenges and prepare for the 21st century, we have implemented a strategy for equipping the reserve component s that defines our requirements for the future and gains agreement with the active force on the most critical mission needs.

Another theme we tackled was quality of life — making sure we take care of our people. It's part and parcel of of force readiness. We've focused on employer support and on family readiness. We've also focused on protecting reservists from great financial loss by implementing a new mobilization insurance program.

So, these have been our four top issues. There's always work yet to be done, but I feel like we've made some solid advancements.

With the Implementation Force out of Bosnia and the Stabilization Force in, what role will our reserve components play?

Their role will continue to be much the same. They'll continue to be an integral part of the operation. The reserves have played an important role, certainly in the civil affairs realm, in the medical realm and in a number of support areas. They have been in Bosnia proper, they have been in some of the surrounding areas in support functions, they have been backfillers in Germany and in certain locations in the United States. I would anticipate they would continue to play an important role in the Stabilization Force.

In the past, you have expressed a strong desire to ensure no one unit or individual is tapped to carry out more than its fair share of contingency missions. With Guard and Reserve members now supporting a second year of operations in Bosnia, is this becoming more of a challenge?

It is, but I think it's a challenge we will meet successfully. We do not anticipate in this rotation the need to call any units that were called for Haiti. We may call up units that served in Operation Desert Storm, perhaps, but then Desert Storm was five, six years ago.

My notion has always been that we must not call reserve units in back-to-back years if we can help it. Now there may be individuals who were in both Haiti and Bosnia; perhaps they volunteered or they changed units. But there should be no units called to both operations. And so far, we've successfully spread the work around. Clearly, the more rotations you have, the more of a challenge that becomes.

Another point to bring out, I think, is the Army Reserve provided the bulk of the reserve forces that supported Operation

Joint Endeavor. Now, we're calling more Army National Guard units. So again, that's spreading the work around to a larger number of units to not tax any single unit or units too much.

With a succession of three deployments for members of the Guard and Reserve, what are you doing to ensure members don't have employer problems when they return?

We have a several-fold strategy. First, we have personnel at all the mobilization sites who brief deploying reservists to make sure they know their rights and responsibilities with respect to employer support. At the tail end of a deployment, we similarly have briefings at the demobilization site or at the home bases so the reservists get a refresher before they go back to work. So, focusing on the reservists and their need to know their rights and responsibilities is the first pillar of the strategy.

The second pillar is focused on the employers. We try to keep in touch with employers, to make sure our paperwork is in order and is submitted to them as quickly and as early as possible. In addition, for every reservist who filled out a form that we provided, Secretary Perry personally wrote to the employers to thank them. We also have award ceremonies to honor employers who have made special efforts to support their Guard and Reserve workers. But the bulk of that effort takes place in the field, with volunteers in each state keeping in touch with employers and doing all of what I just described on a daily basis.

What has volunteers' feedback been regarding their experiences with the employers?

Generally it's supportive. Of course, we do get inquiries. We do hear of problems. There is concern that employers perhaps do not favor the notion of having their workers volunteer for duty, but being more understanding if someone is involuntarily called to duty.

The law that governs reservists' job rights is blind to whether a person volunteers or is involuntarily called. The same protections exist for all. But there is that concern.

We make every effort to turn the tables and see the situation from the employer's standpoint. It's important to consider how many of their employees are called to duty at any given time, how much time they have in terms of advance notice and the frequency of the deployments. If we can successfully spread the work around and give as much notice as possible to employers, then we will have done as good a job as we can do in supporting employer concerns.
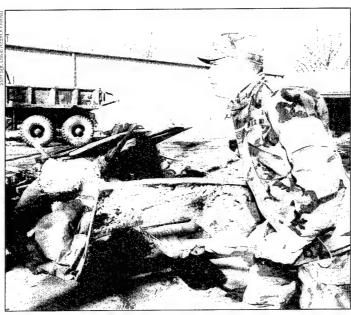
What has this succession of deployments meant to the reserve components and their standing as a member of the total force?

I think the reserves are today more than ever a solid component of the total force. That's a description that's existed for perhaps 20 years, but I think it's reality, and I think active duty commanders view it as ground truth more than they ever have before. They are becoming more and more familiar with reserve capabilities than they ever have been before, and that's because the reserves are going wherever the active military goes and doing whatever the active military does in the world these days. The reserves, I believe, have really come of age, and they are more essential today than ever.

Much of the military's civil affairs and psychological operations efforts, to name just two missions, are in the reserve components. Do you have any concerns that maybe in some cases the active duty force is overly dependent on the reserve components?

The Quadrennial Defense Review will look at the role of the reserve components and structural changes that may be in order. Now, any time that you have 100 percent or 90 percent of a particular mission in either one component or the other, that creates certain stresses and certain reactions. For example, 97 percent of the Army's civil affairs capability resides in the reserve components. And clearly, as a practical matter on all the operations we run, we need contingents of civil affairs personnel. So this is a field very much in demand for every-

Fire and rain bring the National Guard to the rescue. Guard helicopters, **far left,** dump chemicals on dry forest to help stay an approaching fire. The recent devastating rains brought the Kentucky Army National Guard to aid in rescues, **below,** and to help clean up the flood aftermath.

thing from the Haitis of the world to the Bosnias of the world.

It may be that we need to "grow" more civil affairs units, perhaps more in the active component, perhaps more in the reserve components. But again, it's a matter of, if you're going to spread the work around, there has to be someone to spread it to. This is an example of an issue that the Quadrennial Defense Review will look at. Should we have some structural changes in our support forces to expand certain areas, perhaps contract others?

What changes have you seen since the Bottom-up Review was conducted?

think one area that will get a lot of review in the Quadrennial Defense Review is the threat, because the threat drives everything we do.

The Bottom-up Review said we have two major powers in the world that may threaten our interests. We want to notionally be able to fight and win both of those in a nearly simultaneous fashion, and at the time of the Bottom-up Review, those two powers had certain levels of forces and certain capabilities. Four years later, clearly they are both still there in the world. But have their capabilities changed, are they more powerful, less powerful? The threat will be an important factor of this, because it will then drive what our macro-level strategy will be.

The other piece of the emphasis, I think, will focus on the peacetime operations we have been, as a practical matter, running. You need certain kinds of forces for high-level combat. That may or may not be the kind of forces you need for operations such as Bosnia and Haiti. Bosnia and Haiti have required higher level support-oriented forces, and lesser numbers of front-line combat type forces. So there has to be some kind of balance. The Quadrennial Defense Review will look at what that appropriate balance is. That is, do we need to make any changes on the margin?

What could be the effect on the reserve components?

e could see a "growing" of certain kinds of units that have been in high demand. We could see a shrinking of other kinds of units. I would say that would be the key outcome. I feel very confident the Quadrennial Defense Review will reaffirm the notion of using the Guard and Reserve to the maximum extent possible, just as the Bottom-up Review did. I don't see a shift in overall strategy, but do see the possibility of refinements on the margin, based on what we've learned over the past four years about usage.
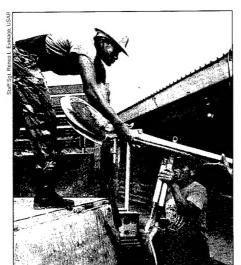
What new initiatives are you particularly proud of?

he reserve components have demonstrated the tremendous value of civil-military cooperation. Essentially, the idea of civil-military cooperation is that in lieu of training in a simulated environment, we send units — particularly support-oriented units such as medical personnel and engineers — to real communities in the United States to either treat people who have medical needs or to do real engineering projects that will be of use to communities.

We have been doing this for years in U.S. Southern Command, for example, but only recently have we placed an emphasis on doing this in the United States. We see it as a "double bang for your buck" issue. Our people get good readiness training, which is our job, No. 1. In addition, they're giving back to communities. So this has worked quite well.

We have a process institutionalized in the Pentagon whereby local commanders and community leaders develop suggested projects and suggested ideas. The military commander must certify the proposal is solid readiness training and then send it up through the chain of command for funding. This has been another success story we will certainly proceed with in the future as well.

As an example of both the medical and the engineering side, to show how this very much fits in with readiness-oriented training, we have run a civil-military project in a very remote part of Alaska above the Arctic Circle for two years now.

Nearly 6,000 Army National Guardsmen from across the U.S. conducted their annual two-week training in a massive engineer-training, humanitarian civic action exercise dubbed "New Horizons-Panama." A North Dakota guardsman drills steel rafters, **far right,** for a medical clinic and another from the Virgin Islands, **near right,** passes shovels to a Panamanian in a remote village. A pair of Utah guardsmen, **below,** wash an air-portable bridge with a high-pressure water hose.

Deborah R. Lee

Lee has been assistant secretary of defense for reserve affairs since May 28, 1993. Prior to this appointment, she worked on the House Armed Services [now National Security] Committee as a professional staff specialist in military personnel and compensation and National Guard and Reserve issues. She earned a bachelor's degree from Duke University in 1979, a master's degree in international affairs from Columbia University, New York City, in 1981 and was then chosen for the Presidential Management Intern program, during which she was assigned at various times to the Army Materiel Command, the National Security Council, and the Executive Office of the President.

This involves Army National Guard, Army Reserve and Marine Corps Reserve personnel, who do it in a joint fashion. They have to load up equipment, deploy to ships and get to Alaska. So they're getting practice in a number of skill areas, just getting ready to deploy, actually deploying, making the trip. Then they have to set up equipment in a remote, difficult area, to say the least.

Once there, they treat people who live there. These folks do not see a doctor or a dentist on a regular basis. And they will also provide certain kinds of engineering projects. The folks who participated reported that never in their entire reserve careers had they ever done anything like this. So they got a lot of experience they wouldn't ordinarily get, and they helped the people in that region very, very much.

What initiatives do you see on the horizon for the reserve components?

First, I think we're likely to stay the course on a number of important themes. We will certainly stand by the theme of increased use of the Guard and Reserve as a policy matter, and I think you will see in our fiscal 1998 budget submission that we will put money in that direction to reflect that policy. So when it comes to increased use, I think you're going to continue to see an emphasis on utilizing the reserves to reduce the active duty personnel tempo, if possible, utilizing them in peacetime operations but still relying upon them in the event we have a major war.

On the readiness front, here again, I believe we will stay the course. So our funding profiles will continue to fund high levels of readiness for our front-line deployers, lower levels for later deployers, but nevertheless, everybody will have adequate funding to make sure they can do the job they need to do in the timeframe they are ordered to do it.

In addition, we are looking at different ways of training that may ultimately save us money and provide a more effective product. Distance learning is one example, where technology will help us provide training outreach to the many, many communities across the nation where reservists live and work. So there's an example of differences in training that may be coming down the line.

And last, I think we will also stay the course on quality of life. We are looking at a number of possible refinements in the mobilization insurance program. They may be a year off, because we have to first understand what it is we have learned from our initial period, and that is not yet up. Making sure we provide proper dental and medical care is another area we will constantly peruse. We are proud we will introduce a new dental insurance program for members of the Guard and Reserve and will have it up and running Oct. 1.
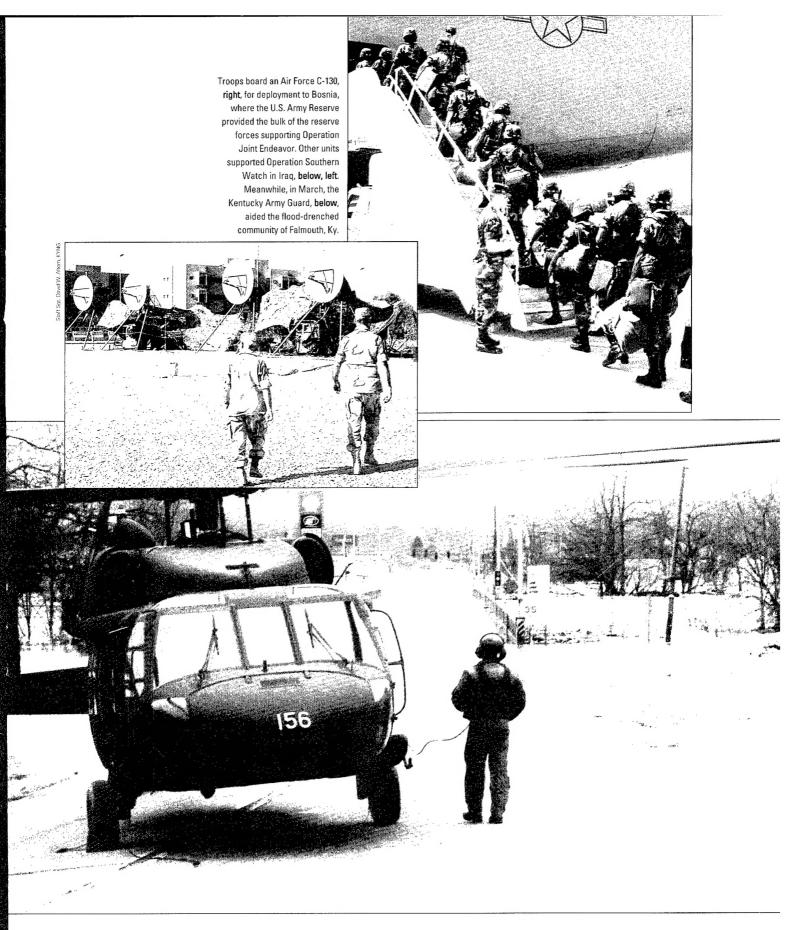
So I think essentially you will see a "stay the course" approach on our major initiatives and major themes and improving on the margins where it seems we need improvement.

What do you see as the biggest challenges ahead in paving the way for the reserve components in their emerging role?

I think the big challenges will be continuing to spread the work so we don't overtax single units and single individuals. We must always monitor employer support, and our statistics are very good at the moment. They are holding steady and strong, but we always have to watch that. We must not rest on our laurels.

Recruiting and retention will be a challenge. The reserve components have been the great beneficiaries of the active duty drawdown because we received a lot of very highly qualified and experienced prior-service personnel into our ranks. Less of this will occur in the future because the active duty drawdown is over. We will have to watch recruiting and retention and work on them very carefully.

And making sure that readiness stays strong in what will be challenging fiscal times — this, too, will be an important area for us. That's why I place such an emphasis on thinking about doing business in different ways.❖

Troops board an Air Force C-130, **right**, for deployment to Bosnia, where the U.S. Army Reserve provided the bulk of the reserve forces supporting Operation Joint Endeavor. Other units supported Operation Southern Watch in Iraq, **below, left**. Meanwhile, in March, the Kentucky Army Guard, **below**, aided the flood-drenched community of Falmouth, Ky.

HEALTHY CHOICES

HEALTHY CHOICES IS OUR
AUTHORIZATION TO EXAMINE
AND UPGRADE SYSTEMS
INCLUDING THE MOST
ADVANCED TECHNOLOGIES
IF IT IS DESIGNED TO IMPROVE
CAPABILITIES AND PRODUCTIVITY
AT THE SAME TIME
UPGRADES ARE PLANNED
FOR SEVERAL EXISTING
DEMONSTRATIONS THAT ARE
AVAILABLE TO BE
BOTH WARRANTED WHEN
IT COMES TO ADJUSTING AND
BALANCING OUR DEFENSE